King County
Department of Natural Resources and Parks
Water and Land Resources Division
Noxious Weed Control Program
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Best Management Practices
Sulfur Cinquefoil - *Potentilla recta*
Roseaceae

Class B Noxious Weed

Description

- Can significantly reduce the forage value of a pasture or rangeland . Invades native plant communities (see Impacts on page 4)
- Perennial with a woody rootstock producing one to several erect stems, 1 to 3 feet in height. Stout, hairy, leafy stems are un-branched up to the flowers.
- Flowers have five butter-colored or light yellow, heart-shaped petals surrounding a darker yellow center.
- Leaves have stiff hairs and are palmately lobed with five to seven long leaflets that are uniformly toothed along the edges.
- Seeds are tiny, dark brown with prominent branched ridges and narrow winged margins.
- Plants typically have a deep taproot surrounded by shallow, spreading branch roots.

Habitat

- Adapted to a wide range of conditions but typically found in grasslands, shrubby areas, logged areas, roadsides, abandoned fields and open forests.
- Found in King County in open grassy areas and with shrubs such as Scotch broom, along railroads and roads, in pastures and abandoned fields.
- Can take advantage of poor soils and disturbed sites but is also successful in moist fields and can out-compete healthy pasture grasses.

Reproduction

- Regenerates annually from new shoots emerging from the edges of the root mass. Typically **flowers from early June through July** with seeds beginning to form in mid to late July. Reproduces by seed but can spread by roots if moved by mechanical equipment.
- Able to produce many flowers and seeds in early stages of succession. Small infestations with only a few scattered plants can rapidly increase in size and density.
- Stems that are knocked to the ground can produce roots at the nodes. Plants that are cut down will produce new shoots from the rootstock.
- Seeds can live 4 or more years in the soil.

Control Methods

The preferred method of control is Integrated Pest Management (IPM). IPM involves selecting from a range of possible control methods to match the management requirements of each specific site. The goal is to maximize effective control and to minimize negative environmental, economic and social impacts.

Control methods should be multifaceted and adaptive, developed to reflect the available time, funding, and labor of the participants, the land use goals, and the values of the community and landowners. Management will require dedication over a number of years, and should allow for flexibility in method as appropriate.

Management Plan

- Eradicate small infestations by digging up roots or by spot-treatment with the appropriate herbicide, followed by re-seeding with grass whenever possible.
- For larger infestations, combine the application of a selective herbicide in the spring with methods that will encourage the growth of competitive grasses such as seeding, fertilizing and good grazing practices. The infested area should then be monitored in June and July for any flowering plants that were missed by the herbicide. All remaining flower heads should be removed before seeds mature in late July or August.
- A non-selective herbicide (such as glyphosate) can be used if combined with effective re-vegetation of the site. If the site is not re-vegetated, sulfur cinquefoil seedlings from the existing seed bank will quickly re-infest the area.
- For 3 to 4 years following treatment, monitor areas for new plants from the seed bank.

Early Detection and Prevention

- Sulfur cinquefoil is difficult to spot in tall grass unless it is in flower. Survey pasture areas, unmanaged grasslands, roadsides and railroad rights-of-way for flowering and pre-flowering plants from **late May to late June**.
- Isolated small populations can be dug up and the site should be monitored over several years for plants growing from root fragments and from the seed bank.
- Prevent plants from spreading from existing populations by washing vehicles, boots and animals that have been in infested areas. Seeds are small and are easily carried in mud and in animal fur.
- If animals are being moved from an infested pasture to an uninfested pasture, first hold them for at least five days so that the seeds pass out of the animals' digestive system.

Manual

- **Dig up plants in the spring or early summer when the soil is still moist and before the seeds mature.** The roots are deep and extensive. Plants will re-sprout from root fragments. Remove as much root as possible.
- If plants are in seed, carefully bag and cut off the seed heads before digging up the rest of the plant. It is very difficult to pull the plants without dispersing the small, lightweight seeds. Brush off boots and clothes before leaving the infested area.
- Areas where mature plants are dug up may become infested with new seedlings unless they are carefully monitored and planted with grass or other competitive vegetation. Infested areas typically have many seedlings and an extensive seed bank.

Mechanical

- **Mowing, however frequent, will not control sulfur cinquefoil** because the massive, woody root system stores considerable food reserves and mowed plants will send up new shoots after mowing.
- Mowed plants respond by becoming lower growing, more branched, and with more bulky, spreading roots. Plants can still re-sprout, flower and set seed in the same season they are mowed. If you do mow, be sure to clean mowers to prevent spreading seeds to uninfested areas.
- A single plowing may increase sulfur cinquefoil cover, however, on productive agricultural sites, an intensive management program that combines cultivation and annual crops will effectively control sulfur cinquefoil.

Biological

- There are no biological control agents currently available for sulfur cinquefoil.

Chemical

- Chemical control options may differ for private, commercial and government agency users. Follow all label directions. Herbicides should only be applied at the rates and for the site conditions / land usage specified on the label.
- **Certain herbicides can not be used in aquatic areas or their buffers**. If herbicides are used, make sure that their use is allowed at your site. Contact your local noxious weed control program for control guidelines in your area.
- Several herbicides are recommended by the PNW Weed Control Handbook for sulfur cinquefoil control. For site specific herbicide recommendations, please contact the King County Noxious Weed Control Program.
- The addition of a suitable surfactant to the herbicide may improve the control results.
- Non-selective herbicides are effective but may damage grass and other vegetation. Treatment with a non-selective herbicide needs to be followed by re-seeding with grass. Without re-seeding, bare areas will be re-infested from the seed bank and by any missed plants.
- Selective herbicides that target only broadleaf plants may be used in grassy areas.

Control in Pastures

- **These recommendations are only for noxious weed control in areas where herbicides can legally be used**.
- Grazing should be managed to encourage grass vigor. A combination of herbicide treatment and nitrogen fertilizer should be used. Fertilizer alone will not work. It will only result in healthier, bigger sulfur cinquefoil plants.
- Suppression of cinquefoil with a selective herbicide will allow grass production to increase, which in turn increases the suppression of the sulfur cinquefoil.
- Apply a nitrogen fertilizer after the selective herbicide application, then manage grazing so that 4 to 6 inches of grass re-growth remains at the end of the growing season to allow grasses to resist re-invasion by the sulfur cinquefoil.
- Overgrazing will allow for rapid spread of sulfur cinquefoil in pasture areas. Only goats have been known to graze sulfur cinquefoil. Other livestock will avoid sulfur cinquefoil unless it is the only forage available.

Additional Information

Legal Status in King County: **Class B Designate** (non-native species designated for control in regions where it is not widespread). **The King County Noxious Weed Control Board requires property owners to control sulfur cinquefoil on private and public lands throughout the county.**

Local Distribution

There are sulfur cinquefoil infestations in most of the cities and rural areas of the county, from Milton to Woodinville and Skykomish, on city, county and state roadsides and on private properties. Most of the sites are in the east part of the county although there are some in the more urban areas. Infestations range in size from small to large, well-established infestations.

Impacts and History

- Has invaded habitats ranging from low to high elevation, from seasonal wet meadows to shrubland and forest ecosystems and does not appear to be limited by soil type.
- Able to invade rangeland areas that are in good condition and not being over-grazed.
- Can significantly reduce the forage value of a pasture or rangeland and is one of the last plants to be grazed by animals.
- Even without over-grazing, it can out-compete grasses and other plants.
- Although most often found in disturbed areas, it has also begun to invade native plant communities that are relatively undisturbed by human activities including open canopy forests, forest openings and logged forests in the western United States.
- Originally from central Europe, Asia and the Middle East.
- Appeared in North America sometime before 1900.
- By 1950 it was well established in the eastern U.S. and Canada and was spreading west. Sulfur cinquefoil was first reported in Washington in 1937 and was reported from 12 counties in the state by 1996.
- Its rapid spread is similar to that of spotted knapweed and leafy spurge even though it was introduced several decades later.

References

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